

PowerLogic® ION7300 / ION7330 / ION7350

Power and energy meters



a brand of
Schneider
Electric



Features

Measurements

- Energy: bi-directional, absolute and net
- Demand: rolling block, predicted, and thermal
- Harmonics: individual and total harmonic distortion up to the 15th or 31st
- Advanced logic and mathematical functions

Internet-enabled communications

- Two RS-485 ports
- Optional built-in modem with ModemGate™ allows modem access for 31 other devices
- Optional Ethernet port with EtherGate™ allows direct Ethernet-to-RS-485 data transfer to 31 other devices
- Infrared data port standard
- Modbus® RTU, Modbus® TCP, DNP 3.0, and PROFIBUS DP
- Call-back feature offers fast alarm response
- Web server, MeterM@il® allow distribution of metered data and alarms over the Internet

On-board data logging

- Scheduled or event-driven logging of up to 96 parameters
- Sequence-of-events and min/max logging

Setpoints for control and alarms

- Setpoint on any parameter or condition
- 1 second operation

Inputs and outputs

- 4 digital inputs for status/counter functions
- 4 digital outputs for control/pulse functions
- Optional analog inputs and outputs





ION7300 series power and energy meters

Used in enterprise energy management applications such as feeder monitoring and sub-metering, ION7300 series meters offer unmatched value, functionality, and ease of use. ION7300 series meters interface to ION Enterprise® software or other automation systems to give all users fast information sharing and analysis.

The ION7300 meters are an ideal replacement for analog meters, with a multitude of power and energy measurements, analog and digital I/O, communication ports, and industry-standard protocols. The ION7330 meter adds on-board data storage, emails of logged data, and an optional modem. The ION7350 meter is further augmented by more sophisticated power quality analysis, alarms and a call-back-on-alarm feature.

Not all features are available with every model. Please refer to the detailed descriptions within for a complete list of feature availability.

Applications summary

- **High-accuracy power and energy metering**
- **Revenue certified models for billing, bill verification and sub-metering**
- **Power quality analysis**
- **Cost allocation and billing**
- **Demand and power factor control**
- **Load studies and circuit optimization**
- **Equipment monitoring and control**
- **Preventative maintenance**

Connections

Installation

- 4-wire Wye, Delta, 3-wire Wye, Direct delta and Single phase systems
- 3 voltage and 3 current inputs
- No PTs required on voltage inputs for wye systems up to 347/600 VAC and delta systems up to 600 VAC
- All inputs pass ANSI/IEEE C37.90.1-1989 surge withstand and fast transient tests

Inputs/outputs*

- The analog I/O option is available for any ION7300 series meter, to monitor flow rates, device cycles (RPM), fuel levels, oil pressures and transformer temperatures, etc. Output energy pulses to an RTU or control equipment.

Control power supply

The meter's basic power supply has a voltage range of 95 - 240 VAC and 120 - 310 VDC.

Measurement specifications ¹ (at 50.0 Hz and 60.0 Hz at 25° C / 77° F)	
Parameter	Accuracy ± (%rdg + %fs ²)
Meter	
Voltage	0.25 % + 0.05 %
Frequency	±0.01 Hz
Current	0.25 % + 0.05 %
kVA	0.05 % + 0.1 %
kWh	0.5% (of reading)
kVAR (>5 % FS)	1.5 %
kVAh	1.0 %
kVARh	1.5 %
Power Factor (at Unity PF)	1.5 %
Harmonics	
Total harmonic distortion	1 % Full Scale
I4 derivation	1% reading + 0.2% unbalanced
K Factor	5.0 % Full Scale

Display resolution meets or exceeds accuracy.

¹ 50 VAC to 347 VAC + 25 %

² % full scale voltage and current

User programmable log capacity

Example log configurations:

Waveform Recording Settings

Meter	Event	Data	Channel	Samples/Channel	Cycles/l	Record Depth	Days
7330	500	A	-	-	-	-	29
	500	B	-	-	-	-	118
	500	C	-	-	-	-	96
	500	D	-	-	-	-	383
7350	500	A	6	32	12	3	28
	500	B	6	32	12	3	111
	500	C	6	16	48	3	26
	500	D	6	64	16	3	331

A 16 parameters recorded every 15 minutes
A 16 parameters recorded hourly

C 4 parameters recorded every 15 minutes
D 4 parameters recorded every hour

Standards compliance

- CE marked
- EMC compliant to:
 - EN 55014-1:1993
 - EN 61000-4-4
 - EN 60687:1993 for immunity to electromagnetic HF fields
 - EN 60687:1993 for immunity to electrostatic discharges
- IEC 1010-1
- IEC 60687 accuracy class 0.5S compliant
- Analog I/O: each analog I/O pin passes IEC 61000-4-4 (4 kVp-p @ 2.5 kHz for 1 min)
- ANSI C12.16 accuracy compliant
- ANSI class 10, (5 A nominal, 10 A max)
- Surge withstand: all inputs pass ANSI/IEEE C37.90-1989 surge withstand and fast transient tests
- OFGEM approved (UK)
- FCC: Part15, FCC Rules for Class A Digital Device
- UL: Certified to UL 3111
- CAN/CSA C22.2 No.1010-1
- Measurement Canada AE-0788

* Analog I/O is not available with all form factors and communications configurations. Please check our on-line order forms for supported combinations.

Operational specifications

Serial RS-485 ports

- ION7300 has a single RS-485 port
- ION7330 and ION7350 meters can have two RS-485 ports
- Supports DNP 3.0

Infrared data port

- Front panel optical port
- Compatible with an ANSI Type 2 magnetic optical communications coupler
- Data rates up to 19,200 bps

Ethernet port (optional)

- Optional 10Base-T port for direct access to metering information via Ethernet LAN/WAN
- EtherGate™ (data transfer between Ethernet and RS-485)

Note: The meter COM2 port functions as a dedicated EtherGate port (RS-485 Master) on ION7330 and ION7350 meters with the Ethernet option

PROFIBUS port (optional)

- PROFIBUS DP standard protocol support via sub-D 9 pin female connector

Internal modem

- ION7330 and ION7350 offer internal modems
- Data rates from 300 bps to 33,600 bps
- ModemGate™ (data transfer between modem and RS-485)

Note: The meter COM1 port functions as a dedicated ModemGate port (RS-485 Master) on ION7330 and ION7350 meters with the internal modem option

- Compatible with power monitoring software that supports Modbus® RTU, ION or DNP 3.0 RJ-11 or a captured wire connector (CWC)
- The ION7350 meter is offered with a call-back feature for quick alarm response

Interoperability

ION7330 and ION7350 communicate via multiple protocols to extend existing Modbus®, DNP or ION Enterprise networks. Logs and real-time values are available via Modbus. Meters supported by UTS MV-90® via serial and Ethernet.

Voltage inputs

- 50 to 347 VAC L-N
- 25% overrange
- CWC option: Pluggable captured-wire connectors
- All options: Overload withstand for 1500 VAC continuous, 3250 VAC for 1 second non recurring.
Input impedance: > 2 M Ohms/phase (phase-Vref)

Current inputs

- 5 A nominal / 10 A full scale
- Starting current: 20 mA
- Overload withstand: 20 A continuous, 500 A for 1 second non-recurring
- Worst case burden (at 10 A): 0.0625 VA
- 20% Overrange full accuracy

Power supply

- Basic: 95 to 240 VAC ($\pm 10\%$), (47 to 440 Hz)
- 120 to 310 VDC ($\pm 10\%$), 0.2 A worst case loading (12 W) at 100 VAC at 25° C (77° F)

Digital outputs

- 4 optically isolated digital outputs
- Maximum forward current: 80 mA
- Maximum voltage: 30 V

Status inputs (ION7330 and ION7350 meters)

- Self-excited, dry contact, no external voltage source required
- +30 VDC differential SCOM output to S1 through S4 inputs
- Minimum pulse width: 25 msec

Analog inputs*

- Accuracy: $< \pm 0.3\%$ of full scale
- Update rate: 1s
- Input impedance: 24.3 W, 475 W (0 to 20 mA, 0 to 1 mA)
- Maximum source impedance (W): 500 W, 10 k Ohms (0 to 20 mA, 0 to 1 mA)
- Channel to channel isolation: None
- Maximum common mode voltage: 30 V

Analog outputs*

- Accuracy: $< \pm 0.3\%$ of full scale
- Maximum load drive capability: 500 W (0 to 20 mA), 10k W (0 to 1 mA)
- Channel to channel isolation: None
- Maximum common mode voltage: 30 V

Operational specifications

Waveform (digital fault) recording

- The ION7350 meter simultaneously captures events on all channels, up to 48 cycles each:
- Resolution: 64 samples per cycle

The maximum number of cycles for contiguous waveform capture is 6,900 (based on 16 samples/cycle x 48 cycles)

Event logging and alarming

Configurable event priorities allow you to define alarm conditions.

- Sequence-of-events timestamped to ± 10 ms accuracy
- Time-stamped record of all configuration changes, setpoint and min/max events

Logic, math and control

The ION7330 and ION7350 meters offer sophisticated logic and mathematical functions to perform on-board calculations on any measured value.

Mathematical functions offered

- Arithmetic (+, x, -, \div)
- Comparison (>, <, =, \geq , \leq , \neq)
- Logical (AND, OR, NOT, TRUE, FALSE, IF)
- Trigonometric (SIN, COS, TAN, ASIN, ACOS, ATAN)
- Math (PI, SQRT, POWER, SUM, SUMSQ, AVG, RMS, LOG10, LN, MAX, MIN)

Programmable logic and setpoints

The ION7330 and ION7350 meters use logical operators and setpoints to set alarms, define basic control algorithms, and implement back-up protection. Setpoints can trigger:

- Data logging
- Digital outputs, pulse outputs
- Clearing and reset functions
- Call-back (ION7350)

Environmental conditions

- Operation: -20°C to $+60^{\circ}\text{C}$ (-4°F to $+140^{\circ}\text{F}$) ambient air
- Storage: -30°C to $+85^{\circ}\text{C}$ (-22°F to $+185^{\circ}\text{F}$)
- Humidity: 5% to 95% non-condensing

Mounting

- Integrated display to fit DIN standard 92 mm x 92 mm (3.6 " x 3.6 ") panel cutout
- TRAN models - no integrated display, flush-mounted against any flat surface
- Optional DIN rail mount. RMD (Remote Display Module), fits a DIN standard cutout up to 1.8 m (6 ft) from the base meter
- Panel punches available
- Weighs approx. 1.8 kg (4 lbs) in box 38 x 28 x 18 cm (15 " x 11 " x 7 ")

Switchboard draw-out cases

- Complete switchboard hardware kit (internal cage with external casing) or "retro-fit" kit for existing GE S1 or ABB FT21 switchboard cases
- The FT21 implementation supports D4B-7F (in Delta volts mode) or D4B-3F (in 4-wire Wye volts mode).

Relay extension board

- An optional Digital Output Extension Board extends the meter's output capabilities with additional relay options (contact Schneider Electric for details)



Front panel display

LCD supports local data display and basic setup

- Easy to read backlit LCD
- Adjustable contrast
- Remote display option to 1.8 m (6 ft) from base unit
- 8 data display screens that can be customized through the communications port to show chosen parameters, scrolled manually or automatically
- 4 display formats: 4 parameter, to single-parameter large character displays

Customer parameter labels (programmable via communications)

Example meter display formats

I a	265.7
I b	256.4
I c	259.2
I avg	260.4

Ia THD	9.3
Ib THD	7.4
Ic THD	3.4
IavgTHD	6.7

Vln a	479.8
I a	376.2

KWh Import	193106
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Energy metering

Energy

The meters are fully bi-directional and monitor energy in all four quadrants. They provide all traditional active, reactive and apparent energy parameters.

- kWh, imported, exported, net (imported and exported), and total (imported and exported)
- kVARh imported, exported, net (imported and exported), and total (imported and exported)
- kVAh total
- kVAh, imported, exported, net (ION7330 and ION7350 meters only)
- Volt-hours and amp-hours
- Integration of any instantaneous measurement

Demand

Supports rolling block, thermal, and predicted demand calculations.

- kW demand and min/max
- kVAR demand and min/max
- kVA demand and min/max
- Amps demand and min/max
- Volts demand and min/max
- Demand on any instantaneous measurement

Time of use (TOU)

The ION7330 and ION7350 meters provide:

- 2-year internal calendar
- Up to 15 daily tariff profiles
- Programmable triggers
- Separate energy and demand accumulators

Operational measurements

Offers the most comprehensive array of instantaneous (real-time) measurements. Measurements include true RMS, per phase and total for:

- Voltage and current
- kW, kVAR and kVA
- Power factor
- Frequency
- Voltage and current unbalance

Min/max recording

Records each new minimum and new maximum value with date and time-stamp for the following parameters:

- Voltage and current min/max
- kW, kVAR, and kVA min/max
- Power factor
- Frequency
- Voltage unbalance, plus any measured value

Features and options	ION7300	ION7330	ION7350
Metering			
Power, energy and demand	■	■	■
Power quality			
Sag/swell monitoring			■
Harmonics: individual, even, odd, up to	15 th	15 th	31 st
Sampling rate, maximum samples per cycle	32	32	64
Logging and recording			
Standard memory		300 kB	300 kB
Min/max logging for any parameter		■	■
Historical logs, maximum # of channels		32	96
Waveform logs, maximum # of cycles			48
Timestamp resolution in seconds		0.001	0.001
Communications and I/O			
RS-485 ports; Ethernet; Optical; IRIG-B	1	2	2
Ethernet/infrared optical ports	1/ 1	1/ 1	1/ 1
Internal modem		1	1
PROFIBUS DP port	1		
DNP 3.0 through serial, modem, and i/r ports		■	■
Modbus RTU slave on serial, modem, and i/r ports	■	■	■
Modbus TCP through Ethernet port	■	■	■
Ethergate data transfer between Ethernet & RS-485		■	■
Modemgate data transfer between internal modem & RS-485		■	■
MeterM@il, logged data alarms via email ¹		■	■
Webmeter, onboard web server	■	■	■
Analog inputs/analog outputs	4/4	4/4	4/4
Digital status inputs/counter		4	4
Digital relay outputs	4	4	4
Setpoints, alarming, and control			
Setpoints, number/minimum response time		1 sec	1 sec
Math, logic, trig, log, linearization formulas		■	■
Single & multi-condition alarms		■	■
Call-out on alarms			■
Revenue metering			
MV-90 on serial, Ethernet ports		■	■
Multi-year scheduling: hourly activity profiles		■	■

¹ The ION7330 meter cannot send email alerts as it does not have an Alert module.

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Software integration

Easy integration with energy management or SCADA systems for remote display of all measured parameters at a PC workstation, remote configuration and manual control abilities.

- ION Enterprise® compatible
- ION Setup™ compatible
- Internet Connectivity
- MeterM@il®
- WebMeter®

PowerLogic® and ION®

Power Measurement and its ION products were recently acquired by Schneider Electric and integrated within our PowerLogic range of software and hardware, creating the world's largest line of power and energy management solutions.



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